

NASA HBCU/MSI TECHNOLOGY INFUSION ROAD TOUR @ UTEP

(April 19, 2016)

Kwang J. Kim, Southwest Gas Professor of Energy & Matter, Mech. Eng.
Mohamed Trabia, Associate Dean of Research, College of Engineering
Rama Venkat, Dean of Engineering
Thomas Piechota, Vice President of Research & Economic Development

University of Nevada, Las Vegas (UNLV)



University of Nevada, Las Vegas

- An American public research university located in the Las Vegas suburb of Paradise, Nevada.
- The 332-acre campus is located approximately 1.6-mile east of the Las Vegas Strip.
- Noted for its strong emphasis on science and technology, business management, and the law programs, the university is classified a "research-intensive university" by the Carnegie Foundation for the Advancement of Teaching.
- Students in 2014
 - Total 28,515
 - Undergraduate 23,813; Postgraduate 4,010; and Doctoral students 715
- Athletics: NCAA Division I – Mountain West
- https://en.wikipedia.org/wiki/University_of_Nevada,_Las_Vegas)

University of Nevada, Las Vegas

- Established in 1957...



1959



1980



State-of-the Art Facilities at UNLV



The Science and Engineering Building (SEB) is a state-of-the-art facility designed for interdisciplinary research and education

The Lied Library (LLB) has the capacity to store 1.8 million volumes and occupies 300,000 square feet in five stories. It has 2,500 study spaces, more than half of them with full network connections



University of Nevada, Las Vegas

UNIVERSITY NAME:	University of Nevada, Las Vegas
ADDRESS:	4505 Maryland Parkway, Las Vegas, NV 89154
PRESIDENT:	Dr. Len Jessup
WEB SITE:	https://www.unlv.edu/

- UNLV is a **doctoral-degree-granting** institution of approximately 29,000 students and more than 3,000 faculty and staff.
- UNLV offers about 220 programs of study in varying fields leading to bachelor's, master's, and doctoral degrees.
- UNLV is accredited by the **Northwest Commission on Colleges and Universities** (NWCCU).



UNLV Ranked Second Most Diverse Campus in the Nation

UNLV jumps from sixth to second place on U.S. News & World Report's annual list for "best ethnic diversity," maintaining a spot in top 10 for fifth consecutive year.

CAMPUS NEWS | SEP 9, 2015 | BY KEYONNA SUMMERS
Media Contact: Keyonna Summers (702) 895-3102; keyonna.summers@unlv.edu

Academics

School of Allied Health Sciences

School of Allied Health Sciences »

The School of Allied Health Sciences prepares students for entry-level health-related positions and further graduate or professional studies with classroom instruction, laboratory/clinical practice, research, and mentoring.

Departments

- [Department of Health Physics and Diagnostic Sciences](#)
- [Department of Kinesiology and Nutrition Sciences](#)
- [Department of Physical Therapy](#)

Degree Programs

- [Allied Health Sciences Degrees](#)

Lee Business School

Lee Business School »

The Lee Business School advances the knowledge and practice of business, develops business leaders, and fosters intellectual and economic vitality through the creation and dissemination of knowledge and outreach.

Departments

- [Department of Accounting](#)
- [Department of Economics](#)
- [Department of Finance](#)
- [Department of Management, Entrepreneurship, and Technology](#)
- [Department of Marketing and International Business](#)
- [MBA Programs](#)

Degree Programs

- [Business Degrees](#)

Academics (continued..)

School of Community Health Science

School of Community Health Sciences »

The School of Community Health Sciences is dedicated to improving the health and well-being of people worldwide. Our departments, programs, and research units work to provide a diverse education, practical training experience, and numerous community involvement opportunities to prepare students to become leaders and professionals in the field of public health.

Departments

- [Department of Environmental and Occupational Health](#)
- [Department of Health Care Administration and Policy](#)

Degree Programs

- [Community Health Sciences Degrees](#)

School of Dental Medicine

School of Dental Medicine »

The School of Dental Medicine provides world-class oral health education while providing for the dental needs of Nevada residents.

Degree Programs

- [Dental Medicine Degrees](#)

Advising

- [Pre-Doctoral Student Advising](#)

Academics (continued..)

College of Education

College of Education »

The College of Education creates an intellectual environment that promotes quality instruction, significant research, and professional service.

Departments

- [Department of Educational & Clinical Studies](#)
- [Department of Educational Psychology & Higher Education](#)
- [Department of Teaching & Learning](#)

Degree Programs

- [Education Degrees](#)

Howard R. Hughes College of Engineering

Howard R. Hughes College of Engineering »

The College of Engineering provides students a solid foundation in several engineering disciplines for a successful career in engineering and computer science.

Departments

- [Aerospace Studies/Air Force ROTC Program](#)
- [Department of Civil and Environmental Engineering and Construction](#)
- [Department of Computer Science](#)
- [Construction Management Program](#)
- [Department of Electrical and Computer Engineering](#)
- [Entertainment Engineering and Design Program](#)
- [Department of Mechanical Engineering](#)
- [Department of Military Science/Army ROTC](#)

Degree Programs

- [Engineering Degrees](#)

Academics (continued..)

College of Liberal Arts

College of Liberal Arts »

The College of Liberal Arts offers students a well-rounded education in the humanities and social sciences, and provides students with a solid foundation for a lifetime of learning and discovery.

Departments

- [Department of Anthropology](#)
- [Department of English](#)
- [Department of History](#)
- [Interdisciplinary Degree Programs](#)
- [Department of Philosophy](#)
- [Department of Political Science](#)
- [Department of Psychology](#)
- [Department of Sociology](#)
- [Department of World Languages and Cultures](#)

Degree Programs

- [Liberal Arts Degrees](#)

School of Nursing

School of Nursing »

The School of Nursing educates nurses at the undergraduate and graduate levels to meet health care needs in Nevada and beyond. The School of Nursing promotes, improves, and sustains human health through evidence-based education and advances in research and practice.

Degree Programs

- [Nursing Degrees](#)

Advising

- [Health Sciences Advising Center](#)

Academics (continued..)

College of Science

College of Sciences »

The College of Sciences provides students a solid foundation in natural, physical, and mathematical sciences for a successful career in the sciences and other professional programs.

Departments

- [Department of Chemistry and Biochemistry](#)
- [Department of Geoscience](#)
- [School of Life Sciences](#)
- [Department of Mathematical Sciences](#)
- [Department of Physics and Astronomy](#)
- [Water Resources Management Program](#)

Degree Programs

- [Sciences Degrees](#)

Greenspun College of Urban Affairs

Greenspun College of Urban Affairs »

The Greenspun College of Urban Affairs emphasizes improvement in the quality of urban life by preparing undergraduate students for professional practice in a variety of fields. Graduate programs advance the body of knowledge of its disciplines, and the improvement of public policy and professional practices.

Departments

- [Department of Communication Studies](#)
- [Department of Criminal Justice](#)
- [School of Environmental and Public Affairs](#)
- [Hank Greenspun School of Journalism and Media Studies](#)
- [Marriage and Family Therapy Program](#)
- [School of Social Work](#)

Degree Programs

- [Urban Affairs Degrees](#)

For more information: <https://www.unlv.edu/academics>

Programs and Degrees of Howard R. Hughes College of Engineering

Aerospace Engineering

[Master of Science](#)

Biomedical Engineering

[Master of Science](#)

Civil Engineering

[Bachelor of Science](#)

[Master of Science](#)

[Doctor of Philosophy](#)

Computer Science

[Bachelor of Arts](#)

[Bachelor of Science](#)

[Master of Science](#)

[Doctor of Philosophy](#)

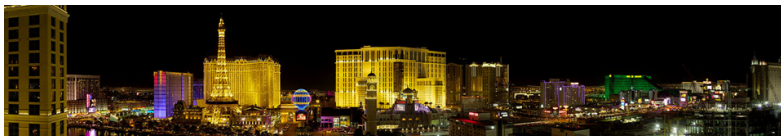
Computer Engineering

[Bachelor of Science](#)

Entertainment Engineering and Design

[Bachelor of Science EED](#)

[Bachelor of Science ETD](#)



2016

U.S. News Best Grad School Rankings

#87
Tie

Civil Engineering

RNP

Computer Engineering

#139
Tie

Electrical / Electronic / Communications Engineering

RNP

Environmental / Environmental Health Engineering

#109
Tie

Mechanical Engineering

(Minor) Programs and Degrees of Howard R. Hughes College of Engineering

Computer Science

[Minor in Computer Science](#)

[Minor in Information Technology](#)

Military Science/Army

[Minor in Military Science](#)

Aerospace Studies & ROTC

[Minor in Aerospace Studies](#)

Unmanned Aircraft Systems

[Minor in Unmanned Aircraft Systems](#)

Solar and Renewable Energy

[Minor in Solar and Renewable Energy](#)

[Graduate Certificate in Solar and Renewable Energy](#)

Tech Commercialization

[Minor in Technology Commercialization](#)

Entertainment Engineering and Design (EED)

[Minor in EED](#)

Student-Centered Engineering Experience



2013 Solar Decathlon



Back in the Sun: UNLV Chosen to Compete in
2017 Solar Decathlon

UNLV Past Performance: Grants & Contracts and Subcontracts

SPONSORED PROGRAM ACTIVITY

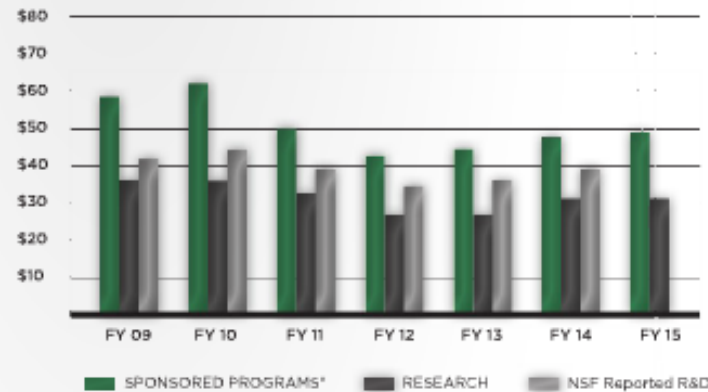
EXPENDITURES

	Sponsored Programs*	Research	NSF Reported R&D
FY09	\$59,359,059	\$26,156,589	\$41,652,000
FY10	\$62,414,679	\$35,913,552	\$44,457,000
FY11	\$50,200,861	\$32,581,329	\$39,526,000
FY12	\$42,924,520	\$27,072,642	\$34,543,000
FY13	\$44,593,471	\$27,649,363	\$35,935,000
FY14	\$48,344,405	\$31,027,377	\$39,448,000
FY15	\$49,262,898	\$31,641,467	**

* Sponsored programs expenditures include research, instruction/training, and other sponsored activity (i.e., public service, student services, etc.).

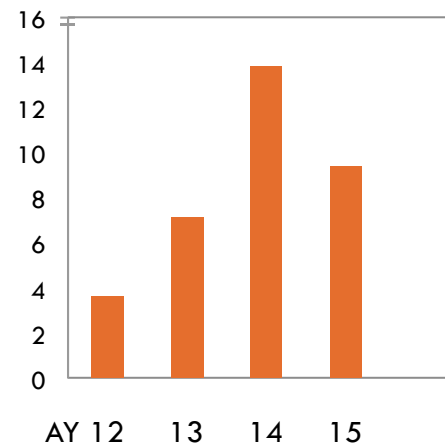
** NSF Reported R&D expenditure data will be available February 2016.

Expenditures FY09-FY15, in millions



UNLV Total

UNLV College of Engineering
Research Expenditures in \$M
(~\$100-150K/Faculty)



UNLV Engineering Research

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- The Howard R. Hughes College of Engineering focuses on creating key technologies that serve the United States, and the world. Our goal is to expand knowledge and provide benefits to society.
- While our faculty pursue innovative solutions to many challenges, they are particularly focused on the following research areas and have established a strong national and international presence:

Big Data

Biomedical Engineering

Environmental Engineering and Water Resources

Materials

National Security Engineering

Renewable Energy

Robotics/Unmanned Aerial Systems

Transportation

Unmanned Aerial Systems

NASA Relevant UNLV/Engineering Past Performance

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- **NASA's Marshall Center to Host Mentor-Protégé Program**
 - UNLV - as part of the NASA Mentor-Protege program with Teledyne Brown Engineering - is developing state-of-the-art e-learning materials for various NASA personnel training courses.
- UNLV is part of **Nevada NASA Space Grant Consortium** (established in 1991).
- UNLV has a few NASA EPSCoR research grants awarded.



July 23, 2015
MEDIA ADVISORY M15-102

NASA's Marshall Center to Host Mentor-Protégé Agreement Signings July 27 between Teledyne Brown Engineering and Two Universities; Media Invited



Engineering Research (Recent Activities): DARPA Robotics Challenge

Team DRC-Hubo@UNLV is an international and multicultural group of researchers, professional partners, and students, both graduate and undergraduate. Each team member specializes in a specific area, such as robot hardware, software, networking and communications. This allows each person to bring their personal expertise to enhance the project.



Congratulations to the DRC-Hubo@UNLV Team for their 8th Place Finish!

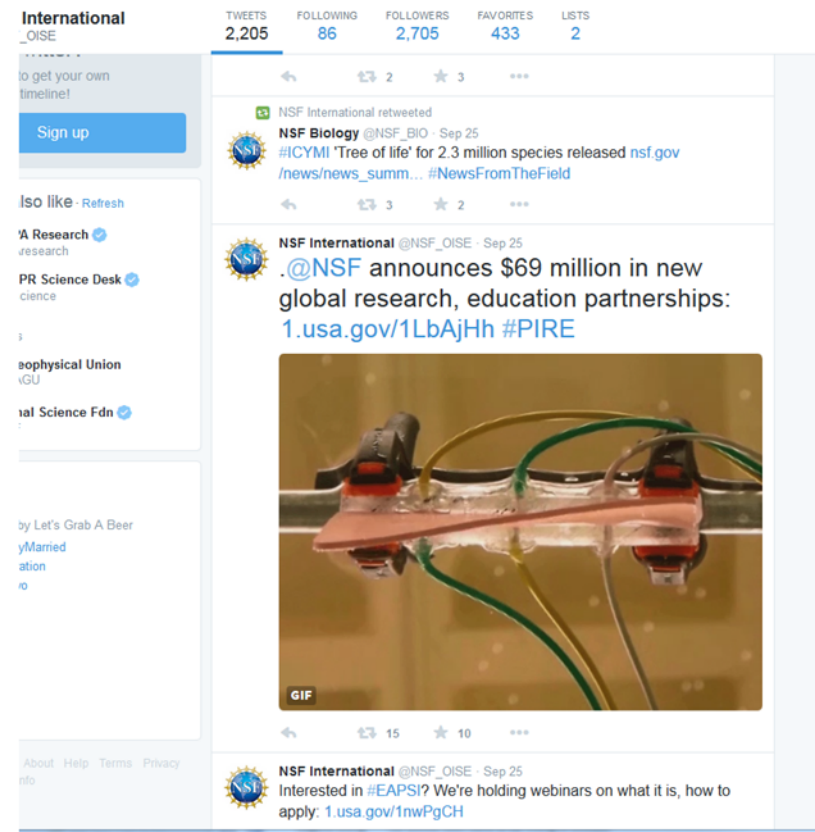


<http://www.drc-hubo.com/>

Engineering Research (Recent Activities): NSF PIRE Project

UNLV-led research team has received a \$3.8 million grant from the National Science Foundation to create advanced artificial muscles for use in soft robotics that could one day help millions of people with disabilities--Partnerships for International Research and Education” (PIRE) program.

Pls: Kwang Kim and Paul Oh



Relevant UNLV Eng. College Past Performance (Contracts/Subcontracts, last 2 years only)

Robotics/Computer

- DRC-Hubo-Leveraging a 7-Hubo Infrastructure and Unified Algorithmic Framework for the DARPA Robotics Challenge, DARPA
- US-Korea Collaborative Software and Hardware - Design of Humanoids for Real-World Tasks in Human-Centered Environments, NSF
- Infrastructure for Enabling Mobile Manipulation Unmanned Aerial Vehicle (MM_UAV) Research and Design, NSF
- Human-Robot Coordinated Manipulation and Transportation of Large Objects, NSF
- Artificial Muscle (AM) Cilia Array for Underwater Systems, ONR
- Electroactive Sensors for Naval Applications, ONR
- Advanced Artificial Muscles for International and Globally Competitive Research and Education in Soft Robotics, NSF
- Unmanned Aerial Vehicle (UAV) Research in Support of Counter Poaching Efforts as a Deterrent to Combatting Illicit Trafficking, Naval Air Warfare Center
- Enhanced Situational Awareness Using Unmanned Autonomous Systems for Disaster Remediation, NSF
- Development of Plug-and-play Interchangeable Components for Unmanned Aerial System with Mobile Manipulation Capability, DOE/SRNS
- Tracking Object Parts and Learning Interactions Rules, NRL

Energy

- Thermal Dynamics and Neutronics Modeling Simulations on RTMSR Reactor Design, Utah Green Energy Technologies
- The Solar Energy-Water-Environment Nexus, NSF
- Advanced Transport Technologies for NASA Thermal Management/Control Systems, NASA

Relevant UNLV Eng. College Past Performance (Contracts/Subcontracts, last 2 years only....)

Materials

- Additive Manufacturing (AM) Workshop, NASA EPSCoR
- Experimental Characterization and Computational Simulation of Shock Propagation and Failure Mechanisms in Complex Materials, NSTec
- The Development of N-Type Hybrid Thermoelectric Materials with High Performance, Hyundai
- Super-Hydrophobic Surface Enabled Microfluidic Energy Conversion, NSF

Electronics

- Photodetectors and High-Speed Electronics Using Silicon Germanium (SiGe) Bipolar/CMOS (BiCMOS) Integrated Circuits, NSTec
- Advanced Printed Circuit Board Design Methods for Compact Optical Transceiver, Attollo Engineering
- Quantum Cryptography Single Photon Detector Chip, Freedom Photonics

Environmental

- Chromium Contamination Remediation Using Activated Carbon Coated with Polysulfide Rubber and Zeolites Coated with Surfactants, Savannah River Nuclear Solutions

Educational Services

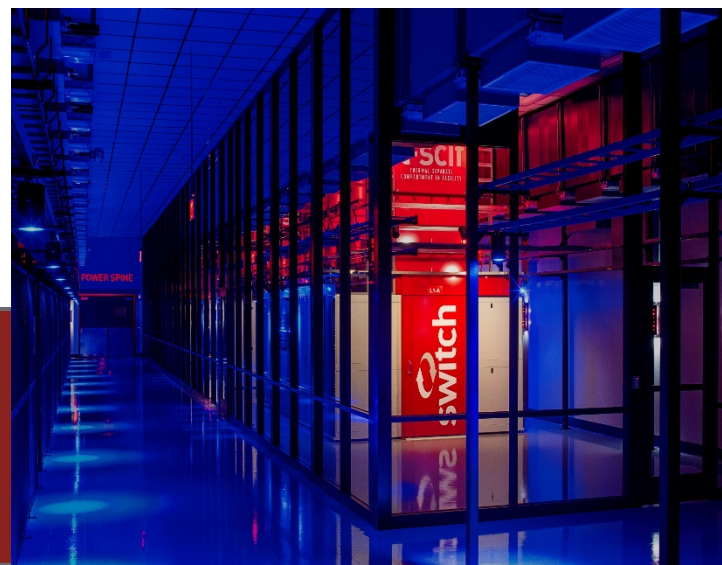
- Lego Robotics for the Blind and Visually Impaired, Pacific Foundation for the Blind

Campus-wide Activity Example #1: UNLV-Switch-Intel Partnership

- ❑ Switch high speed connection (unlimited bandwidth)
- ❑ Data center with 1000 private sector customers
- ❑ Intel Cherry Creek Supercomputer (41st on Green List and 400th fastest)
- ❑ Puts UNLV in top 5 of Tier 1 universities with High Performance Computing
- ❑ Example research – genetic data for personalized medicine



Joe Lombardo – Executive Director of National Supercomputing Center for Energy and the Environment, UNLV
John White – EVP and Provost, UNLV | Don Snyder – UNLV President | Bryan Wolfe – VP, Managing Director, Intel Capital | Rob Roy – CEO and Founder, Switch | Charlie Wutschpard – VP, Intel | Dr. Mark Seager – CTO, Intel
Martin Leslie – Business Development Manager, Intel | Jason Mendenhall – EVP of Cloud, SUPERNAP



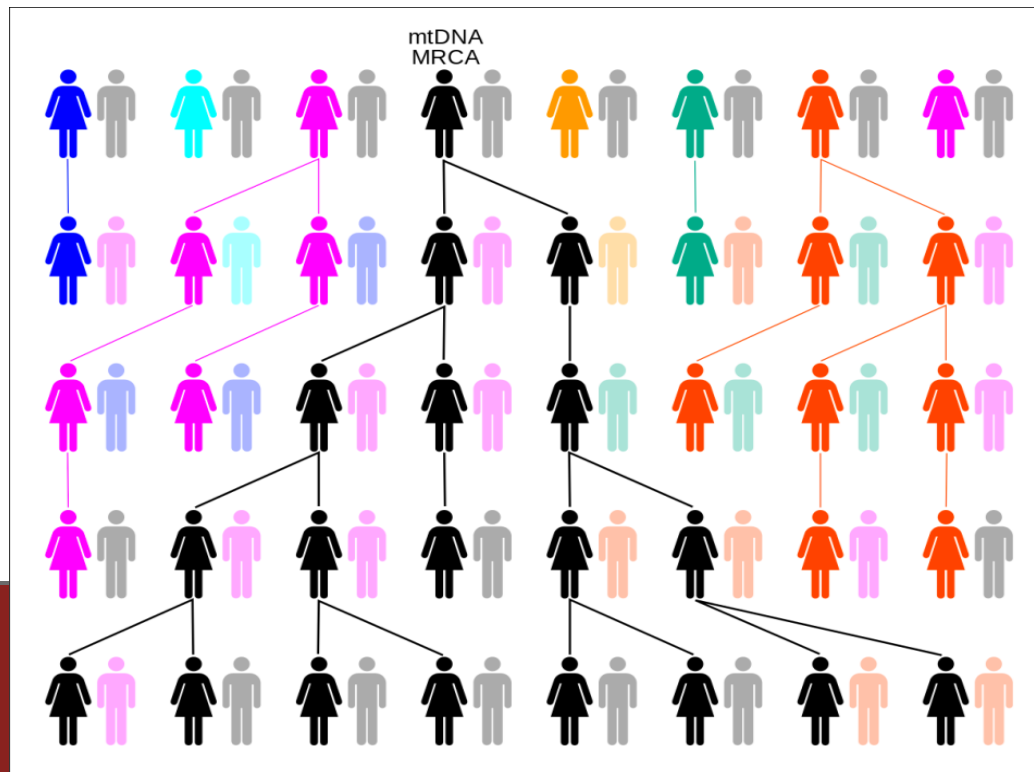
Campus-wide Activity Example #2: NSF Solar Energy-Water-Environment Nexus

- Research to Explore Solar Energy, Water, and Environmental Issues
 - ▣ Dr. Bob Boehm, Distinguished Professor
 - ▣ Dr. Jaci Batista, Professor



Campus-wide Activity Example #3: Nevada Institute of Personalized Medicine

- Nevada Institute of Personalized Medicine
 - ▣ Dr. Martin Schiller, Executive Director



Campus-wide Activity Example #4: Tesla Motors Research Program

- Research on material reprocessing
 - ▣ Water and wastewater
 - ▣ Batteries



Tesla Gigafactory



https://www.google.com/search?q=tesla+gigafactory&rlz=1C1JZAP_enUS688&espv=2&biw=1735&bih=1256&tbn=isch&imgil=UHZyvC-_87v_zM%253A%2538m4uGrme1SAozmM%2538https%25253A%25252F%25252Fwww.teslamotors.com%25252Fgigafactory&source=lu&pf=m&fir=UHZyvC-_87v_zM%253A%25252Cm4uGrme1SAozmM%25252C_&usg=__Q057Q1j9Hv0Cm4vgaHYRNCKPbMI%25252D&ved=0ahUKEwiYoPKuoZnMAhUT82MKHUXCBQ8QyjcOg&ei=_2lVV9ikNJpmjwPMhJV4#imgcr=wJkYv2q8Tw78IM%3A



Dean Dr. Rama Venkat

UNLV | HOWARD R. HUGHES College of ENGINEERING



Associate Dean Dr. Mohamed B. Trabia

Howard R. Hughes College of Engineering Contact(s) Points of Contact

■

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<https://youtu.be/AEAA4DjqzXA>



Thanks for your attention!